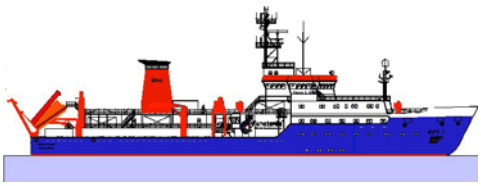

R/V Maria S. MERIAN
Cruise No. 1 Leg 3

Preliminary Report

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IFM-GEOMAR
Leibniz-Institut für Meereswissenschaften
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Objectives

Maria S. Merian Expedition 1 leg 3 addressed biological, geological and hydrographical questions in the mud volcano province of the Gulf of Cadiz. The cruise divided in two sub-legs started in Kiel (Germany) with an intermediate stop in Cadiz (Spain) and ended in Lisbon (Portugal). Station work was exclusively restricted to the EEZs of Morocco and Portugal.
Main Objectives were the measurement of benthic boundary layer bio-geochemical fluxes, fluid and gas flow and investigations of specific ecosystems such as anoxic chemosynthetically based sediment communities and reef building stone corals. Investigations were partly carried out in the frame of the “Geotechnology “ Programm of the German Federal Ministry of Education and Research., namely by the IFM-GEOMAR based programme COMET (Controls on methane fluxes and their climatic relevance in marine gas hydrate-bearing environments). Another part of the expedition was dedicated to investigations of the EU FP-6 programme HERMES (Hotspot Ecosystem Research on the Margins of European Seas). 6 HERMES partners participated in the cruise. Both programmes were comprehensive and thematically complex thus there were a magnitude of content-oriented, personnel and logistic cross cuttings besides the geographical orientation to the Gulf of Cadiz.

Working Programme

COMET investigations focused on a variety mud volcanoes ranging from 3800m to 350m depth (Fig. 1) The mud volcanoes were surveyed in detail with the multi-beam to receive bathymetric maps of a higher resolution which will complement the existing data base. The produced detailed maps enabled us to improve the positioning of our sampling gear (TV-multiple corer, TV- grabs, gravity corer) and landers. They were also the basis for the planning of OFOS (ocean floor observation system) survey tracks to chart the distribution of chemo-synthetic communities indicating fluid seepage. OFOS investigations occupied a large amount of time.

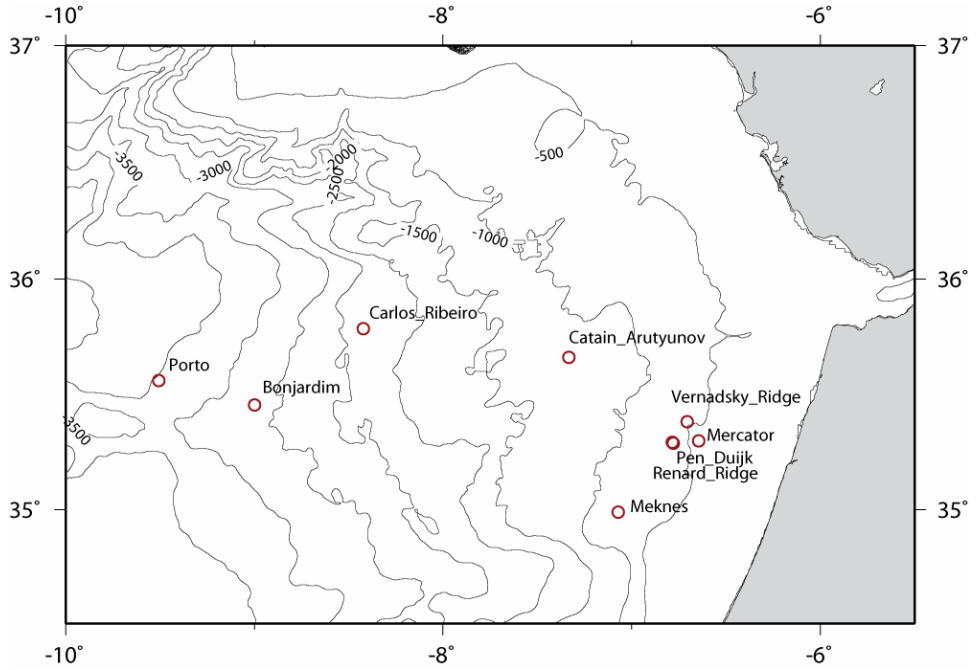

Figure 1: Positions of investigated mud volcanoes and ridges

Geochemical investigations of sediment cores obtained with gravity corers and TV multiple corer were a main emphasis of our activities to obtain detailed information about the genesis and source depth of fluids. Environmental relevant parameters such as methane- and sulphate oxidation rates and oxygen consumption are the basis to determine the effectiveness of the biological filter for the release of methane into the water column. Sediment analyses comprised of: a) geological/mineralogical analyses to determine vent induced mineral reactions in sediments such as carbonate-, barite- and pyrite-formation; b) the analysis of physical properties (porosity), c) determination of element- and carbonate contents (TOC, N, S, $CaCO_3$); e) determination of sulphate reduction and methane oxidation. Pore water analyses comprise the determination of: CH_4, H_2S, SO_4, NO_2, NO_3, CL, PO_4, Si L, Br, alkalinity, Ca, Mg, Sr, Ba, Li, Na, K, Mn, B.

Rosette water samples encompassed: a) geochemical water analyses (O_2, CO_2, NO_3, Si, PO_4, $\delta^{18}O$, DIC, N_2O, CO), b) degassing of water samples (C1–C4) and isotopic analyses at home, c) determination of inert gases (He, Ne, Ar, Xe) and He-isotops to investigate stripping-effects in the vicinity of condensed gas flare activity.

Lander deployments and near bottom water sampling aimed at the quantification of in situ benthic fluxes particularly of methane, oxygen, NO_3, SO_4, SO_3, NH_4. at surficial sediments and in the BBL. The investigation were carried out with novel observatories and sampling gear which are integrated into the modular GEOMAR Lander system. Landers were exclusively deployed with a launching device which enables video-controlled deployment on defined structure or biocoenoses. The following observatories were deployed: BIGO (Biogeochemical Observatory), GasQuant (hydroacostic Gas Bubble Quantification), FLUFO (Fluid Flow Observatory), DOS (Deep-Sea Observatory), BWS (Bottom Water Sampler), PWPL (Porewater Pressure Lander).

Carbonate and rocks samples were retrieved with the large TV-grab. This sampling procedure has been well proven with the sampling of massive chemoherm complexes and diagenetic carbonates in sediment. Samples were only visually analysed and stored for further processing at home which comprise of petrographic, isotopic and age determinations.

The composition and distribution of benthic communities at mud volcanoes was investigated with OFOS, TV-multiple corer and box grab. The integration of varying analytical methods (image analysis, biological and chemical sediment analyses) on different spatial scales at different sites enables us to correlate macrofauna associations with fluid flow and other environmental parameters. The investigations comprised:a) biological analyses of sediment samples (composition distribution, biomass of macro, meio- ,mikrofauna; ^{13}C-isotopic composition); b) ecological analyses for a better habitat characteristic of vent fauna; c) Chlorophyll a determination as indicator of photosynthetically produced organic carbon; d) phospholipid measurements of sediments for biomass determination of mikrofauna (bacteria, fungi, protozoa, meiofauna).

HERMES investigations were also based on detailled bathymetric and visuell surveys of selected mound and ridge systems with multi-beam and OFOS. The perception of the smale scale lateral variability of different sediment and biofacies-types was the prerequisite for a targeted sampling. The integrated registration of small- and meso-scale faunal distribution patterns with hydrographic data enables a differentiated evaluation of the functionality of mound structures as “ecosystem hotspots” in time and space.

Box grab and multiple corer samples rendered selected samples from coral bioherms and ambient sediments to obtain representative samples for the different sediments and biofacies. Sediment samples were analysed to describe the three dimensional geometry of the sediments and its inhabitants. Biodiversity of meio- and macrofauna is analysed under morphological and functional aspects. Geochemical ultra-structural analyses (stabile

isotopes, trace elements) are applied to estimate growth rates and detect recent and fossil environmental signals.

Paleo-environmental conditions are reconstructed from highly resolved time series analyses of sediment cores taken from bioherms and ambient sediments with the gravity corer.

Sediment sampling was supplemented by hydrographic investigations of the respective sampling box. Temperature, salinity, oxygen and particle concentration are measured along highly resolved transect of CTD/Rosette water sampler casts. Water samples will be analysed for stabile isotopes and carbon ratios.

A long-term observatory (DOS Lander) was deployed at a coral biocoenosis on Renard Ridge until August 2006 and will be retrieved with FS METEOR. The following instrumentation was be integrated into the lander: storage CTD, sediment trap, 3 ADCPs(up looking and down looking) and a stereo camera system. Another lander with a pore water pressure lance and a CTD was also deployed until August 2006 on Captain Arutyunov Mud Volcano.

Participants & Participating Institutions

The Cruise was lead by Dr. Olaf Pfannkuche from IFM-GEOMAR, Kiel Germany. Twenty three scientists from five nation participated. A Spanish observer participated on sub-leg 3b (Cadiz – Lisbon).

The following institutions took part in the cruise:

- IFM-GEOMAR, Leibniz-Institut für Meereswissenschaften, Wischhofstr. 1-3, 24148 Kiel,Germany
- Unversity Erlangen, Institut für Paläontologie, Loewenichstr. 28, 91054 Erlangen, Germany
- University Kiel, SFB 574, Wischhofstr. 1-3, 24148 Kiel, Germany
- Univiversity Aveiro: Centro de Estudos do Ambiente e do Mar, Campus de Santiago, 3810-193 Aveiro, Portugal
- University Gent: Renard Centre of Marine Geology, Krijgslaan 281 S8, Gent, Belgium
- University Cardiff: School of Earth, Ocean and Planetary Sciences, Univ. Cardiff Main Building, Cardiff CF10 3YE; UK
- University Rabat: Institut Scientifique, BP 703, Avenue Ibn Batouta, Rabat Agdal, Morocco

Narrative of the Cruise

Wednesday, 12-04-2006
MARIA S. MERIAN cast off at Bollhörn Kai in Kiel at 10:12h starting the third leg of expedition No. 1 (Fig. 2). On board were a party of 23 scientists and a group of distinguished guests and journalists. The visitor group left the ship after entering the Kiel Kanal locks at Holtenau and was replaced by a second visitor group which joint us for the 99km passage through the Kiel Kanal. The passage through the canal took 9 hours to reach the locks at Brunsbüttel where the second visitor group was disembarked. We continued our journey down the Elbe estuary into the North Sea.

Thursday, 13-04-2006
During the night we passed through the German Bight and in the course of the day we continued our journey along the Dutch and Belgian coast. Winds were mainly blowing from the south-west with maximum strength of 6-7Bft during mid day.

Friday, 14-04-2006
We passed through the Channel during the night and progressed along the English south shore under moderate weather conditions. At 15:00h we changed our course to approach Brest to take over two technicians from IXSEA for the calibration of the Posidonia navigation system.

Saturday, 15-04-2006
We progressed towards Brest during night. In the morning we reached Brest roadstead at 13:00h for the rendezvous with the pilot boat. We then proceeded towards Brest Harbour where we to over the technicians from the pilot boat. MERIAN took course to the Bay of Biscay heading to Cap Finistere. In the late evening we started to calibrate the Posidonia system at the continental slope (ca. 1600m depth). Unfortunately the transmitting/receiving unit in the moon pool was not working when attached to the deck unit. Since the reason for the malfunction could not be located we decided to dismantle the whole Posidonia system for an inspection at IXSEA in France. We decided to disembark the technician and the Posidonia parts in Vigo (Spain) on Monday morning.

Sunday, 16-04-2006
During Sunday we crossed the Bay of Biscay. At 12:30h we stopped the ship to test the LWL-cable in combination with the OFOS system at a sounding depth of 4830m. We paid out 4900m of LWL cable to get a bottom view and towed the OFOS system with a speed of 1kt 1,5m above the bottom for about 10min. The quality of the colour TV-transmission was excellent and all systems triggered by the telemetry unit functioned well. The spooling of the deep sea winch went smoothly. Afterward we continued our progress to Vigo.

Monday, 17-04-2006
We reached the anchorage outside Vigo where we dropped the anchor at 08:20h. At 09:40h a boat took the IXSEA technicians and the Posidonia equipment ashore. Afterwards we continued our journey along the Lusitanian coast to the Gulf of Cadiz.

Tuesday, 18-04-2006
We continued our journey and reached our first station the Bonjardim MV in the western Gulf of Cadiz in the afternoon at 17:30h. We started station work (Station No. 126) with a CTD/Rosette water sampler cast at 3100m depth. During the evening and night we mapped the Bonjardim MV area with the multi beam and run several OFOS transect across the mud volcano.

Wednesday, 19-04-06
The preceding OFOS survey enabled us to detect areas of chemosynthetic activity on the north-western rim of Bonjardim MV where we spotted abundant Pogonophera tubes and clam shells. During the morning we placed two successful gravity corer casts of at this sites rendering more than 3m sediment cores each for geochemical and microbiological investigations. The deployment of the TV-MUC had to be stopped in surface waters since the LWL-cable failed. The station had to be cancelled since the damage could not be repaired in an appropriate time frame. A box grab sample at the same locality rendered good results. A CTD/Ro cast in the evening had also to be stopped in surface waters because of problems with the conductive cable. After changing gear to the second conductive cable the deployment was successful.

Thursday, 20-04-06
The ship changed position during the night to steam to the Porto MV about 25nm west of Bonjardim MV. Porto MV situated in 3900m is the deepest mud volcano known so far from the Gulf of Cadiz. We mapped Porto MV with multi beam during the night and returned to Bonjardim MV in the morning, where we started station work with another box grab sample from the Pogonophera biocoenosis. In the course of the day we deployed the Deep Sea Observatory Lander (DOS) and the Fluid Flow Lander (FLUFO) on the summit of Bonjardim

MV. In the evening we took a TV-multiple corer sample from a Pogononophora biocoenosis, which was followed by a CTD/Ro cast.

Friday, 21-04-2006
During the night we headed to the Carlos Ribeiro MV to map the area with multi beam as a basis for further investigations. We left Carlos Ribeiro in the morning and headed to Porto MV which was mapped during the previous night. Based on the drawn up bathymetric map we drove several transects with the OFOS across Porto MV. The OFOS investigations revealed the occurrence of abundant Pogonophora tubes on the top plateau of the Porto MV. We could also find scattered shells of the chemo-symbiontic bivalve Acharax. During the evening and night we took two gravity corer samples and two box grab samples in the centre of the hill top. The gravity core samples showed strong methane enrichments pointing to the occurrence of methane hydrates destabilized during the passage through the water column. The box grab samples comprised Pogonophera and living Acharax specimens. We also deployed a CTD/Ro in this sampling series.

Saturday, 22-04-2006
We left Porto MV in the morning and steamed back to Bonjardim MV where we successfully retrieved the DOS and FLUFO Lander deployed on the 20-04. Afterwards we headed back to Porto MV preparing the landers for another deployment. The DOS-Lander was deployed in the late afternoon and the FLUFO Lander in the evening on a Pogonophera field.

Sunday, 23-04-2006
We left Porto MV and headed to Carlos Ribeiro MV during the night. Upon arrival we made a CTD/Ro cast on top of the mud volcano. We then drove two extensive OFOS tracks across the Carlos Ribeiro area crossing over the top and the eastern flank of the mud volcano. Besides scattered bivalve shells on the top we found no living indicators of chemo-symbiontic processes. The OFOS survey lay the basis of the placement of the sediment coring devices gravity corer and box grabs which were deployed during the evening. We succeeded to sample gas hydrates with both types of samplers.

Monday, 24-04-2006
During the night we steamed back to Porto MV where we started station work with a CTD/Ro cast. During the course of the day we deployed three MUCs in a Pogonophera assemblage followed by a gravity corer. The gravity corer sample contained gas hydrates which were destabilized during the passage through the water column. The night was spent with a series of van Veen grab samples to retrieve benthic organisms for taxonomic studies.

Tuesday, 25-04-2006
We retrieved the DOS- and FLUFO- Lander in the morning thus ending our station work at Porto MV. We then headed back to Carlos Ribeiro MV where we undertook two MUC casts on the top of the mound. In the evening we deployed the FLUFO Lander at the previous MUC sampling sites. Afterwards we left Carlos Ribeiro MV and steamed to Captain Arutyunov MV located 60nm east of Carlos Ribeiro MV.

Wednesday, 26-04-2006
We reached Captain Arutyunov MV in the middle of the night and started investigations with a CTD/Ro cast which was followed by a multi beam survey of the area. Based on the produced bathymetric map we performed three OFOS transects across the MV. The OFOS films proofed the existence of chemosynthetic activity (clam shells) in centre of the mound top. Hart grounds settled with corals were spotted at the mound basis. A gravity corer on the top proofed the occurrence of gas hydrates. The evening and night was spent with CTD/Ro casts at five locations at Captain Arutyunov MV.

Thursday, 27-04-2006
The night was spent with CTD/Ro cast and two boxgrab samples on the top of Captain Arutyunov MV. In the morning we deployed the BIGO-Lander on the south-east corner of the top. We headed back to Carlos Ribeiro MV in the afternoon. We interrupted our journey 8 nm east of Carlos Ribeiro and took a gravity corer sample for paleo-oceanographic studies. At Carlos Ribero we retrieved the FLUFO Lander deployed on the previous Tuesday. We then headed back to Captain Arutyunov MV where we deployed the DOS Lander next to the BIGO deployment site during mid night.

Friday, 28-04-06
The night was spent with five CTD/Ro casts on the top of Captain Arutyunov MV which was followed by a MUC sample in the morning. Sediments were extremely soft with oxygenated surface layer of only a few millimetres thickness. The mud was populated by enormous numbers of small red Pogonopherans. The afternoon was dedicated to gravity coring on the hill top. This activity was followed by the sampling of coral inhabited hard grounds at the southern base of Captain Arutyunov MV with the large TV-grab. The second sample retrieved large clasts settled with reef building corals of the genus Caryiophyllia whereas the first deployment missed a target. The night was spent with van Veen grab sampling in different depth regions of Captain Arutyunov MV.

Saturday, 29-04-06
The van Veen grab sampling ended in the morning which was followed by the sampling of benthic boundary layer water (0-80cm above the seabed) in centimetre intervals with the BWS Lander. In the afternoon we drove an OFOS transect basically in east – west orientation across Captain Arutyunov MV. Two gravity corer samples were taken in the late afternoon and early evening, subsequently followed by another OFOS at the south-eastern basis of the MV, where more coral patches were observed around the 1400m depth contour. The night was dedicated to a multi beam survey of the wider area surrounding Captain Arutyunov MV.

Sunday, 30-04-06
The sites of the coral patches located in the previous OFOS survey were sampled with a van Veen grab. We then returned to the top of the MV for another CTD/Ro cast to study near bottom methane distribution in the water column. After the CTD/Ro cast we retrieved the BIGO Lander which had worked perfectly. After two additional CTD/Ro casts to complete our time series studies at a site of enhanced BBL methane occurrence we steamed some miles off Captain Arutyunov MV to take two gravity corer samples. The first corer acted as a reference for the helium analyses and the second was used for paleo-oceanographic studies. We then steamed back to the top of Captain Arutyunov where we took two box grab samples. In one of the samples large gas bubbles escaped from the box grab when it came to the water surface indicating the presence of gas hydrates which were then found in quite shallow sediment depth of about 20cm.

Monday, 01-05-06
The night was spent with a multi beam survey to enlarge our bathymetric map in the vicinity of Captain Arutyunov MV. The morning was dedicated to water column investigation at the shallow gas hydrate site sampled with the box grab the day before. For this purpose we deployed the BWS-Lander and the CTD/Ro. The site was also sampled with the multiple corer during mid day. In the afternoon we deployed the BIGO-Lander at the gas hydrate site. After another CTD/Ro cast next to the moored BIGO we stopped station work and headed to Cadiz leaving the DOS- and BIGO-Lander deployed.

Tuesday, 02-05-06
We docked at Cadiz at 08:30h where a part of the scientific crew was exchanged and a multitude of repairs and guarantee works were undertaken by various contractors including the installation of the POSIDONIA system by technicians from IXSEA.

Wednesday, 03-04-06
We left Cadiz at 19:50h and headed back to Captain Arutyunov MV with a service technician from IXSEA on board.

Thursday, 03-05-06
In the late night we interrupted our transit to Captain Arutyunov MV some miles off the MV where we deployed a POSIDONIA transponder on a short mooring at 1160m depth in order to calibrate the newly installed POSIDONIA System. The calibration proceeded according to our plans. However, when we tried to retrieve the mooring with the Posidonia transponder the mooring did not swim up although the acoustic releases had confirmed the release from the anchor weight. We decided to postpone any salvage operation and steamed to Captain Arutyunov MV where we successfully retrieved the BIGO lander deployed on Monday (01.05). We headed back to the mooring side and decided to salvage the mooring with the OFOS equipped with some short draglines and hooks. Another POSIDONIA beacon on the OFOS enabled a precise navigation of the OFOS and turned out concurrently as a good test for the functioning of the POSIDONIA system. In consequence we could spot the anchor weight with the first approach of OFOS and with the help of the outstanding manoeuvrability of the ship we were able to push OFOS against the mooring next to the release transponders. The impact of the OFOS was sufficient to set the entangled acoustic releases free. The mooring swam up immediately and could be retrieved safely. We then headed back to the Cadiz pilot station to disembark the IXSEA service technician and to take in a journalist from the pilot boat. Afterwards we steamed back to Captain Arutyunov MV to continue our station work.

Friday, 05-05-06
We arrived at Captain Arutyonov at midnight and started station work with an OFOS survey. The day was spent with gravity corer casts and CTD/Ro castd on the top of the MV where the gas hydrates were sampled before with the box grab. The FLUFO Lander was deployed in the evening followed by the deployment of the BWS Lander at the same site. In the later evening we deployed for the first time the PWPL Lander 6m apart from FLUFO. The PWPL carries a pore water lance of two metres length which is driven by a motor into the sediment. With this deployment we finished our station work at Captain Arutyonov and steamed east towards the region of the shallow Moroccan mud volcanoes. Our target was the Mercator MV which was reached shortly after mid night.

Saturday, 06-05-06
We started station work at Mercator MV with a comprehensive OFOS survey in order to identify areas of enhanced biological activity triggered by methane flow. We could visualize methane bubbles near the top of the MV. This site remained the target area for our activities during the day comprising of CTD/Ro casts, multiple corer sampling, gravity corer casts and box corer sampling. A CTD/Ro sample and a gravity corer were also taken off mound. In the evening we proceeded 20nm west to deep water (≥ 1100m) to retrieve deep water with the CTD/Ro and to gain a sound velocity profile to calibrate the multi beam system.

Sunday, 07-05-06
After our excursion to deeper water we headed eastwards to the Renard Ridge and performed an OFOS survey at the Pen Duick escarpment on a transect perpendicular to the ridge to map coral occurrences. We left the area in the morning and headed back in north-west direction to the Captain Arutyunov MV where we deployed the BIGO Lander at the gas hydrate site at mid day. The following BWS-Lander station failed since the heavy swell prevented the required undisturbed sea floor placement of the gear attached to the LWL cable. In the afternoon and early evening we retrieved three landers from the top of Captain Aruyunov: DOS Lander, FLUFO Lander and PWPL Lander. Afterwards we steamed back to Renard Ridge where we started a comprehensive OFOS survey on the western crest of the ridge.

Monday, 08-05-06
We finished the OFOS survey in the morning and continued station work with three gravity corer casts on the crest of the Pen Duick escarpment. The following attempt to sample outcropping rocks with the TV-grab failed. Afterwards we continued gravity corer sampling on Renard Ridge which was followed by box grab sampling at the coral sites on the western crest of the ridge. In the evening we steamed further south to the Meknes MV and started to map the area also encompassing a pockmark field and carbonate structures in the vicinity of the MV.

Tuesday, 09-0-06
The OFOS survey at Meknes MV was finished in the morning and was followed by some 12kHz echo sounder surveys in the foot hills of Meknes for gas flare detection. Unfortunately no gas flares were detected. Afterwards we steamed back to Mercator MV to sample with CTD/Ro, gravity corer and multiple corer. This sampling activity ended in the evening. We steamed back to Meknes MV where we performed an OFOS surveys with a transect crossing the whole mound.

Wednesday, 10-05-06
Another OFOS transect was driven during the late night in the vicinity of Meknes MV. We then steamed north to Captain Arutyunov MV where we arrived in the morning. We started station work with two BWS Lander deployments at the gas hydrate site and deployed the PWPL Lander at the same locality. We finished station work at Captain Arutyunov in the evening with the retrieval of the BIGO lander. We left Captain Arutyunov and headed back to Mercator MV where we deployed the GasQuant Lander 50m from a previously detected gas bubble site.

Thursday, 11-05-06
The first part of the night was dedicated to CTD/Ro casts around the GasQuant deployment site. From the late night until morning we surveyed the north-western foot hills of Mercator with the OFOS, The day was dedicated to gravity corer sampling on the top of Mercator MV and an area east of the MV, the later for paleo-oceanographic studies. In the afternoon we retrieved GasQuant and took again a multiple corer sample on the top of Mercator MV. In the afternoon we steamed to the north-west to take a deep water sample in more than 700m depth afterwards we proceeded to the Vernadski Ridge where we undertook three OFOS transects until next morning.

Friday, 12-05-06
We performed three gravity corer casts in the course of the morning at Renard Ridge and Pen Duick Escarpment. We changed position again during mid-day to Captain Arutyunov MV where we performed a CTD/Ro cast and a multiple corer cast at the gas hydrate site on the mound top. The multiple corer contained gas hydrates in 20cm depth which were still destabilising when brought on deck. The planned deployment of the FLUFO Lander failed in view of the bottom since the TV- and command connection via the launcher failed because of short circuit in the LWL cable. We changed programme to three transects with a towed CTD/Ro which sampled near bottom water at different locations.

Saturday, 13-05-06
The towed CTD/Ro transects were finished in the morning. Since the damage in the LWL could not be repaired in due time. We changed strategy to deploy landers targeted to the gas hydrate site and released the FLUFO and BIGO Lander hanging on a Posidonia transponder, a procedure which worked perfectly. In the afternoon we steamed south again to Meknes MV where we took two gravity corer samples. We then changed position to Pen Duick Escarpment to take two box corer samples. During the night we sampled selected positions of the OFOS transect on Vernadski Ridge from Thursday with ten van Veen grab casts.

Sunday, 14-05-06
At Sunday morning we headed back to Meknes MV where we took two box grab samples. The area between the two stations was surveyed with OFOS in order to test the restored LWL-cable. The cause of the malfunction was found in the plug of the extension cable and could be repaired. In the afternoon we took four gravity corer samples at Meknes which was followed by a towed CTD/R0 transect over from the southern base to the top region of the mud volcanoes.

Monday, 15-05-06
A series of four CTD/Ro casts was performed during the night at a depth transect ranging from 200m – 1500m at 35°N in order to analyse the distribution of water masses at this latitude. At the end of the transect we took a long gravity corer sample for paleo-0ceanographic studies. Afterwards we steamed north and arrived at Captain Arutyunov in the early afternoon where we retrieved the BIGO Lander deployed on Saturday (13.05). We headed south again and surveyed the western part of Renard Ridge with two OFOS transects. We then changed position to Meknes MV where we took two box core samples on the top and on the western flank of the MV.

Tuesday, 16-05-06
We sampled the western part of Renard Ridge on north to south transect with CTD/Ro casts until morning. Afterwards we headed again to Captain Aruytunov. We interrupted our transect about 9 nm south of the MV too take a gravity corer for paleo-oceanography. At mid day we arrived at Captain Arutyunov and retrieved the FLUFO deployed on Saturday (13-05). Subsequently we surveyed the gas hydrate site on the top with a highly resolved OFOS grid and three towed CTD/Ro transects. In the evening we deployed a PWPL lander for a long-term measurement until August (2006) when the lander will be retrieved with FS METEOR. Afterwards we steamed back to Renard Ridge.

Wednesday, 17, 05-06
We reached Renard Ridge in the early night and performed two OFOS transects on the western flank. Subsequently we took a series of CTD/Ro casts perpendicular to the preceding OFOS transect. The results of the OFOS surveys served as a basis for the site selection of the long-term deployment of the DOS-Lander at a carbonate mound. The DOS was prepared in the course of the morning and a series of plankton net hauls were taken in the mean time. The DOS was deployed at mid day for a long-term measurement until August (06) when lander will be also retrieved with FS METEOR. Afterwards we sampled a large carbonate boulder with the TV-Grab on Renard Ridge. The day was completes with multi beam mapping of Renard Ridge and Mercator MV. With the completion of the last multi beam survey (Station No. 358) at 23:25h we finished station work of MSM 1/3.

Thursday, 18-05-06
At 00:20h we started our transit to Lisbon. We crossed the Golf of Cadiz during the day heading towards Cabo de Sao Vicente.

Friday, 19-05-06
We arrived at Lisbon in the morning and took over a container at the Santa Apolonia container terminal. RV Maria S. Merian was moored some 100metres down stream of the container terminal. The scientific party left the ship during mid day thus ending Merian cruise 1 leg 3.

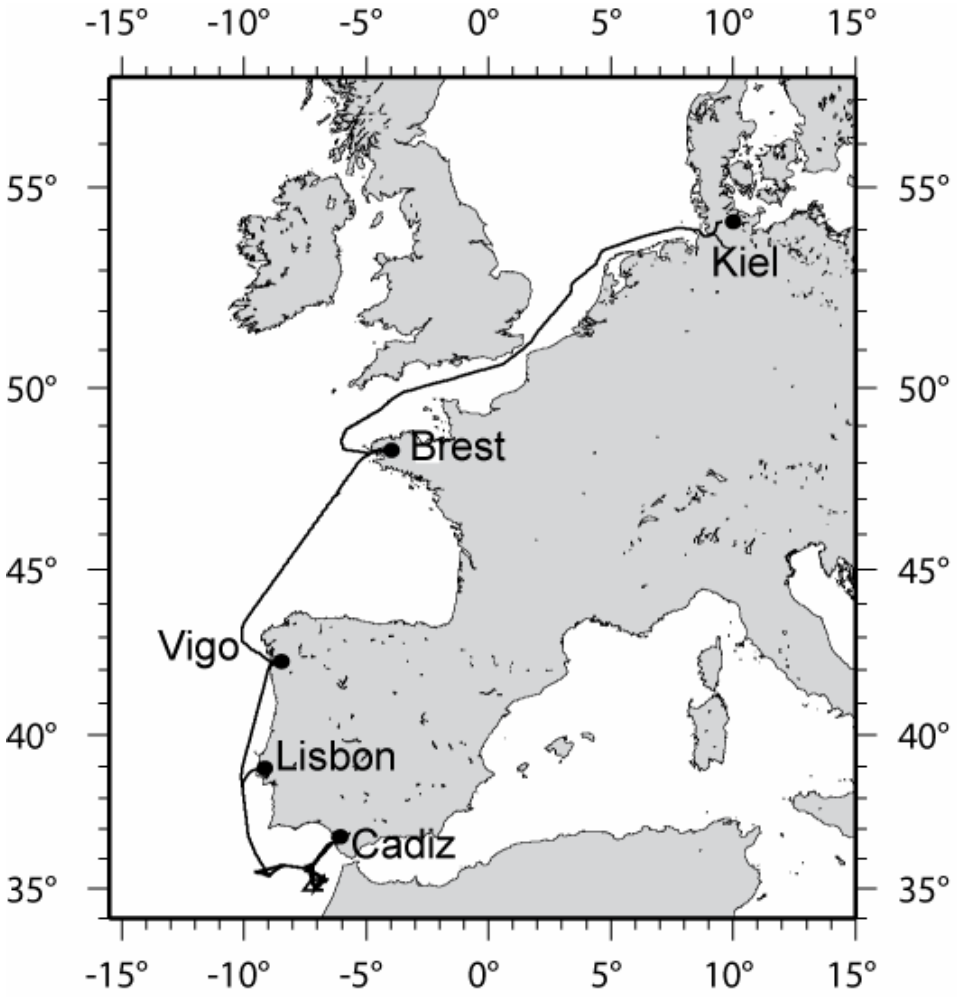

Figure 2: Track chart of MARIA S. MERIAN Cruise 1 leg 3.

Station list and list of employed gear

- **MB/PS** (Multi Beam/Parasound)
- **CTD/Ro** (CTD/Rosette Water Sampler)
- **APN** (Apstein Net)
- **OFOS** (Ocean Floor Observation System):
- **TVG** (Large TV-Grab)**:**
- **GKG** (USNEL box corer)**:**
- **BG** (Van Veen Grab)
- **MUC** (Multiple Corer)**:**
- **GRC** (Gravity Corer)**:**
- **BIGO** (Biogeochemical Observatory, Lander)**:**
- **DOS** (Deep Sea Observatory, Lander)**:**
- **FLUFO** (Fluid Flow Observatory, Lander):
- **BWS** (Bottom Water Sampler, Lander)
- **GASQUANT** (Gas Quantification, Lander)
- **PWPL** (Pore Water Pressure Lance, Lander)

Station list: see overleaf

Station	Gear	No.	Location	Date	Start	Coordinates		Depth	at bottom	Coordinates		Depth	end stat.	Coordinates		Depth
No.				2006	UTC	Lat. :N	Long. :W	(m)	UTC	Lat. :N	Long. :E	(m)	UTC	Lat. :N	Long. :E	(m)
126	CTD/Ro	1	Bonjardim MV	18.04.2006	15:26	35:27.355'	09:00.024'	3075	17:23	35:27.355'	09:00.023'	3089	18:30	35:27.355'	09:00.026'	3073
127	MB/PS	1	Bonjardim MV	18.04.2006	19:44	35:29.009'	08:56.041'	3100					22:44	35:26.280'	09:03.930'	
128	OFOS	1	Bonjardim MV	18.04.2006	23:42	35:26.973'	08:59.932'	3119	0:49	35:26.974'	08:59.973'	3121	4:10	35:28.596'	09:01.431'	3178
129	MB/PS	2	Bonjardim MV	19.04.2006	6:12	35:30.750'	09:02.630'	3300					7:05	35:30.750'	09:02.630'	3300
130	GRC	1	Bonjardim MV	19.04.2006	7:58	35:27.816'	09:00.136'	3048	9:02	35:27.817'	09:00.136'	3049	10:14	35:27.815'	09:00.136'	3043
131	GRC	2	Bonjardim MV	19.04.2006	10:34	35:27.813'	09:00.133'	3048	11:38	35:27.814'	09:00.134'	3048	12:47	35:27.799'	09:00.097'	3062
132	MUC	1	Bonjardim MV	19.04.2006	14:10	35:27.784'	09:00.081'	3051					14:28	35:27.780'	09:00.080'	3050
133	GKG	1	Bonjardim MV	19.04.2006	17:34	35:27.820'	09:00.127'	3049	18:21	35:27.821'	09:00.128'	3049	19:07	35:27.820'	09:00.130'	3050
134	CTD/Ro	2	Bonjardim MV	19.04.2006	21:36	35:27.822'	09:00.128'	3049	23:28	35:27.822'	09:00.128'	3047	0:50	35:27.820'	09:00.128'	3048
135	MB/PS	3	Porto MV	20.04.2006	3:05	35:31.990'	09:27.530'	3802		35:33.160'	09:27.380'	3822	4:16			
136	GKG	2	Bonjardim MV	20.04.2006	6:12	35:27.816'	09:00.134'	3064	7:12	35:27.817'	09:00.135'	3066	8:23	35:27.186'	09:00.135'	3064
137	DOS Lander	1	Bonjardim MV	20.04.2006	11:34	35:27.785'	09:00.083'	3063	13:30	35:27.909'	09:00.261'	3068	14:39	35:27.910'	09:00.265'	3068
138	FLUFO Lander	1	Bonjardim MV	20.04.2006	15:50	35:27.774'	08:59.955'	3089	18:28	35:27.548'	08:59.893'	3052	19:43	35:27.549'	08:59.893'	3052
139	MUC	2	Bonjardim MV	20.04.2006	20:20	35:27.425'	08:59.684'	3055	21:40	35:27.559'	08:59.884'	3054	22:39	35:27.558'	08:59.882'	3051
140	CTD/Ro	3	Bonjardim MV	20.04.2006	22:57	35:27.817'	09:00.121'	3062	0:49	35:27.816'	09:00.124'	3062	2:05	35:27.800'	09:00.100'	3062
141	MB/PS	4	Carlos Ribeiro MV	21.04.2006	5:24	35:47.110'	08:23.121'	2272					6:17	35:46.106'	08:24.001'	2308
142	OFOS	2	Porto MV	21.04.2006	11:00	35:33.547'	09:30.413'	3870	12:05	35:33.564'	09:30.408'	3870	14:54	35:33.901'	09:30.448'	3865
143	GRC	3	Porto MV	21.04.2006	15:13	35:33.702'	09:30.436'	3862	16:37	35:33.703'	09:30.439'	3860	17:48	35:33.705'	09:30.439'	3860
144	GRC	4	Porto MV	21.04.2006	17:59	35:33.705'	09:30.434'	3860	19:17	35:33.703'	09:30.433'	3860	20:24	35:33.700'	09:30.430'	3860
145	GKG	3	Porto MV	21.04.2006	20:37	35:33.699'	09:30.437'	3861	21:36	35:33.699'	09:30.437'	3860	22:38	35:33.700'	09:30.438'	3861
146	CTD/Ro	4	Porto MV	21.04.2006	23:00	35:33.704'	09:30.438'	3861	1:05	35:33.703'	09:30.437'	3860	2:17	35:33.705'	09:30.439'	3862
147	GKG	4	Porto MV	22.04.2006	2:27	35:33.701'	09:30.438'	3859	3:31	35:33.707'	09:30.440'	3859	4:35	35:33.700'	09:30.438'	3860
148	DOS Recovery	1	Bonjardim MV	22.04.2006	7:09	35:27.883'	09:00.045'						8:14	35:27.890'	08:59.910'	3063
149	FLUFO Recovery	1	Bonjardim MV	22.04.2006	9:40	35:27.409'	08:59.586'						10:50	35:27.730'	08:59.650'	
150	DOS Lander	2	Porto MV	22.04.2006	14:05	35:33.696'	09:30.431'		17:04	35:33.772'	09:30.517'	3860	18:33	35:33.772'	09:30.516'	3861
151	FLUFO Lander	2	Porto MV	22.04.2006	19:40	35:33.776'	09:30.518'	3861	21:40	35:33.771'	09:30.516'	3862	22:45	35:33.770'	09:30.520'	3863
152	CTD/Ro	5	Carlos Ribeiro MV	23.04.2006	4:11	35:47.240'	08:25.339'	2197	5:28	35:47.240'	08:25.339'	2197	6:20	35:47.241'	08:25.339'	2198
153	OFOS	3	Carlos Ribeiro MV	23.04.2006	6:55	35:47.927'	08:25.919'	2268	7:37	35:47.928'	08:25.918'	2267	13:27	35:47.874'	08:25.936'	2265
154	GRC	5	Carlos Ribeiro MV	23.04.2006	13:57	35:47.263'	08:25.351'	2198	14:42	35:47.257'	08:25.357'	2198	15:34	35:47.256'	08:25.358'	2198
155	GRC	6	Carlos Ribeiro MV	23.04.2006	15:47	35:47.263'	08:25.355'	2197	16:29	35:47.263'	08:25.359'	2197	17:18	35:47.264'	08:25.358'	2197
156	GRC	7	Carlos Ribeiro MV	23.04.2006	17:28	35:47.264'	08:25.361'	2200	18:08	35:47.266'	08:25.359'	2198	18:56	35:47.265'	08:25.358'	2198
157	GKG	5	Carlos Ribeiro MV	23.04.2006	19:02	35:47.265'	08:25.357'	2199	19:48	35:47.270'	08:25.360'	2200	20:38	35:47.267'	08:25.357'	2199
158	GKG	6	Carlos Ribeiro MV	23.04.2006	20:54	35:47.389'	08:25.344'	2209	21:39	35:47.389'	08:25.343'	2211	22:24	35:47.390'	08:25.344'	2211
159	CTD/Ro	6	Porto MV	24.04.2006	4:18	35:33.873'	09:30.592'	3866	6:24	35:33.874'	09:30.590'	3866	7:45	35:33.873'	09:30.592'	3868
160	MUC	3	Porto MV	24.04.2006	8:09	35:33.751'	09:30.501'	3863	9:17	35:33.753'	09:30.501'	3863	10:22	35:33.753'	09:30.501'	3863

Station	Gear	No.	Location	Date	Start	Coordinates		Depth	at bottom	Coordinates		Depth	end stat.	Coordinates		Depth
No.				2006	UTC	Lat. :N	Long. :W	(m)	UTC	Lat. :N	Long. :E	(m)	UTC	Lat. :N	Long. :E	(m)
161	MUC	4	Porto MV	24.04.2006	10:44	35:33.753'	09:30.501'	3864	11:58	35:33.754'	09:30.499'	3864	13:00	35:33.754'	09:30.500'	3862
162	MUC	5	Porto MV	24.04.2006	13:20	35:33.753'	09:30.499'	3862	15:01	35:33.738'	09:30.492'	3863	16:06	35:33.736'	09:30.491'	3863
163	GRC	8	Porto MV	24.04.2006	17:29	35:33.735'	09:30.481'	3862	18:44	35:33.734'	09:30.483'	3861	19:59	35:33.740'	09:30.480'	3863
164	BG	1	Porto MV	24.04.2006	20:20	35:34.020'	09:30.318'	3893	21:49	35:34.019'	09:30.315'	3888	0:16	35:34.019'	09:30.316'	3896
165	BG	2	Porto MV	25.04.2006	0:31	35:34.021'	09:30.316'	3897	1:40	35:33.904'	09:30.348'	3871	2:37	35:33.907'	09:30.346'	3874
166	DOS Recovery	2	Porto MV	25.04.2006	5:07	35:33.907'	09:30.347'	3860					6:10	35:33.610'	09:30.380'	3880
167	FLUFO Recovery	2	Porto MV	25.04.2006	6:42	35:33.484'	09:30.297'						8:05	35:33.612'	09:30.382'	3861
168	MUC	6	Carlos Ribeiro MV	25.04.2006	13:00	35:47.254'	08:25.356'	2199	13:42	35:47.255'	08:25.354'	2200	14:25	35:47.256'	08:25.361'	2204
169	MUC	7	Carlos Ribeiro MV	25.04.2006	14:45	35:47.257'	08:25.360'	2199	15:29	35:47.256'	08:25.361'	2199	16:09	35:47.256'	08:25.366'	2198
170	FLUFO Lander	3	Carlos Ribeiro MV	25.04.2006	17:15	35:47.261'	08:25.347'	2197	18:31	35:47.260'	08:25.346'	2200	19:15	35:47.260'	08:25.346'	2200
171	CTD/Ro	7	Captn Arutyunov MV	26.04.2006	0:16	35:39.573'	07:20.050'	1329	1:00	35:39.574'	07:20.051'	1328	1:39	35:39.573'	07:20.052'	1328
172	MB/PS	5	Captn Arutyunov MV	26.04.2006	3:00	35:40.710'	07:20.560'						6:14	35:39.050'	07:20.690'	2131
173	OFOS	4	Captn Arutyunov MV	26.04.2006	7:38	35:39.928'	07:19.851'	1358	8:08	35:39.927'	07:19.851'	1357	12:53	35:39.310'	07:20.150'	1369
174	GRC	9	Captn Arutyunov MV	26.04.2006	15:07	35:39.740'	07:19.949'	1323	15:43	35:39.736'	07:19.959'	1322	16:15	35:39.738'	07:19.974'	1322
175	CTD/Ro	8	Captn Arutyunov MV	26.04.2006	16:32	35:39.738'	07:20.070'	1326	17:17	35:39.738'	07:20.070'	1325	17:45	35:39.741'	07:20.069'	1325
176	CTD/Ro	9	Captn Arutyunov MV	26.04.2006	18:14	35:39.744'	07:19.905'	1323	19:00	35:39.743'	07:19.904'	1323	19:30	35:39.745'	07:19.905'	1323
177	CTD/Ro	10	Captn Arutyunov MV	26.04.2006	20:29	35:39.676'	07:19.898'	1320	21:11	35:39.675'	07:19.898'	1321	21:43	35:39.677'	07:19.900'	1320
178	CTD/Ro	11	Captn Arutyunov MV	26.04.2006	22:00	35:39.600'	07:19.893'	1325	22:29	35:39.601'	07:19.893'	1325	23:00	35:39.601'	07:19.894'	1325
179	CTD/Ro	12	Captn Arutyunov MV	26.04.2006	23:10	35:39.602'	07:19.988'	1324	23:50	35:39.602'	07:19.998'	1324	0:40	35:39.601'	07:19.987'	1324
180	GKG	7	Captn Arutyunov MV	27.04.2006	1:04	35:39.735'	07:19.960'	1324	1:38	35:39.740'	07:19.960'	1323	2:25	35:39.740'	07:19.960'	1323
181	GKG	8	Captn Arutyunov MV	27.04.2006	2:39	35:39.644'	07:20.045'	1322	3:05	35:39.642'	07:20.046'	1323	3:47	35:39.642'	07:20.046'	1321
182	BIGO Lander	1	Captn Arutyunov MV	27.04.2006	8:35	35:39.735'	07:19.959'	1320	9:38	35:39.673'	07:19.974'	1317	10:08	35:39.680'	07:19.980'	1317
183	GRC	10	Paleo-oceanogr. site	27.04.2006	13:53	35:46.061'	08:15.397'	2092	14:38	35:46.060'	08:15.397'	2094	15:17	35:46.060'	08:15.397'	2093
184	FLUFO Recovery	3	Carlos Ribeiro MV	27.04.2006	16:10	35:47.124'	08:25.291'	2204	16:12				17:10	35:47.130'	08:25.020'	2233
185	DOS Lander	3	Captn Arutyunov MV	27.04.2006	21:23	35:39.665'	07:19.966'	1317	22:10	35:39.664'	07:19.967'	1317	22:42	35:39.667'	07:19.967'	1317
186	CTD/Ro	13	Captn Arutyunov MV	27.04.2006	23:46	35:39.614'	07:14.000'	1309	0:27	35:39.613'	07:14.000'	1310	0:55	35:39.616'	07:14.000'	1310
187	CTD/Ro	14	Captn Arutyunov MV	28.04.2006	1:50	35:39.589'	07:19.936'	1327	2:33	35:39.586'	07:19.934'	1326	3:05	35:39.585'	07:19.934'	1326
188	CTD/Ro	15	Captn Arutyunov MV	28.04.2006	3:34	35:39.715'	07:19.936'	1321	4:15	35:39.717'	07:19.936'	1320	4:50	35:39.716'	07:19.936'	1320
189	CTD/Ro	16	Captn Arutyunov MV	28.04.2006	5:20	35:39.697'	07:20.080'	1326	6:06	35:39.699'	07:20.081'	1324	6:40	35:39.699'	07:20.080'	1323
190#1	MUC	8	Captn Arutyunov MV	28.04.2006	7:08	35:39.666'	07:19.969'	1316	7:39	35:39.665'	07:19.970'	1322	8:05			
190#2	MUC	9	Captn Arutyunov MV	28.04.2006	8:33	35:39.668'	07:19.970'	1316	9:05	35:39.668'	07:19.970'	1320	9:33	35:39.668'	07:19.970'	1317
191	GRC	11	Captn Arutyunov MV	28.04.2006	10:05	35:39.644'	07:20.046'	1321	10:53	35:39.639'	07:20.049'	1322	11:18	35:39.640'	07:20.050'	1323
192	GRC	12	Captn Arutyunov MV	28.04.2006	11:45	35:39.697'	07:20.082'	1325	12:13	35:39.698'	07:20.080'	1325	12:36	35:39.700'	07:20.080'	1325
193	CTD/Ro	17	Captn Arutyunov MV	28.04.2006	13:45	35:39.726'	07:19.937'	1322	14:31	35:39.722'	07:19.938'	1322	14:58	35:39.725'	07:19.938'	1322
194	TV-Grab	1	Captn Arutyunov MV	28.04.2006	15:30	35:39.231'	07:20.028'	1401	16:55	35:39.282'	07:20.012'	1379	17:29	35:39.290'	07:20.010'	1394

Station	Gear	No.	Location	Date	Start	Coordinates		Depth	at bottom	Coordinates		Depth	end stat.	Coordinates		Depth
No.				2006	UTC	Lat. :N	Long. :W	(m)	UTC	Lat. :N	Long. :E	(m)	UTC	Lat. :N	Long. :E	(m)
195	TV-Grab	2	Captn Arutyunov MV	28.04.2006	18:22	35:39.286'	07:20.040'	1395	19:56	35:39.274'	07:20.013'	1390	20:37	35:39.270'	07:20.020'	1394
196	BG	3	Captn Arutyunov MV	28.04.2006	21:43	35:39.427'	07:19.922'	1339	22:21	35:39.426'	07:19.924'	1339	22:45	35:39.426'	07:19.922'	1339
197	BG	4	Captn Arutyunov MV	28.04.2006	23:05	35:39.596'	07:19.903'	1324	23:39	35:39.597'	07:19.901'	1324	0:02	35:39.597'	07:19.900'	1327
198	BG	5	Captn Arutyunov MV	29.04.2006	0:27	35:39.779'	07:19.985'	1327	0:59	35:39.777'	07:19.958'	1327	1:22	35:39.775'	07:19.984'	1327
199	BG	6	Captn Arutyunov MV	29.04.2006	1:37	35:39.758'	07:20.074'	1329	2:09	35:39.758'	07:20.074'	1329	2:33	35:39.759'	07:20.075'	1330
200	BG	7	Captn Arutyunov MV	29.04.2006	2:47	35:39.681'	07:20.171'	1333	3:21	35:39.688'	07:20.166'	1332	3:46	35:39.684'	07:20.172'	1333
201	BG	8	Captn Arutyunov MV	29.04.2006	3:58	35:39.616'	07:20.288'	1344	4:31	35:39.615'	07:20.290'	1344	5:00	35:39.617'	07:20.291'	1343
202	BWS	1	Captn Arutyunov MV	29.04.2006	7:15	35:39.698'	07:20.082'	1323	7:40	35:39.697'	07:20.081'	1325	8:35	35:39.695'	07:20.080'	1323
203	CTD/Ro	18	Captn Arutyunov MV	29.04.2006	8:50	35:39.697'	07:20.079'	1323	9:36	35:39.694'	07:20.083'	1323	10:25	35:39.697'	07:20.081'	1326
204	OFOS	5	Captn Arutyunov MV	29.04.2006	10:49	35:39.529'	07:19.609'	1356	11:17	35:39.529'	07:19.605'	1356	13:40	35:39.490'	07:20.500'	1415
205	GRC	13	Captn Arutyunov MV	29.04.2006	14:06	35:39.697'	07:20.081'	1326	14:42	35:39.697'	07:20.082'	1326	15:18	35:39.700'	07:20.080'	1329
206	GRC	14	Captn Arutyunov MV	29.04.2006	15:21	35:39.697'	07:20.083'	1326	15:48	35:39.696'	07:20.080'	1326	16:17	35:39.700'	07:20.080'	1325
207	OFOS	6	Captn Arutyunov MV	29.04.2006	17:03	35:39.045'	07:20.001'	1424	17:35	35:39.044'	07:20.001'	1423	19:44	35:39.357'	07:19.754'	1376
208	MB/PS	6	Captn Arutyunov MV	29.04.2006	20:30	35:39.000'	07:20.120'	1300					3:29	35:40.020'	07:13.090'	1293
209	BG	9	Captn Arutyunov MV	30.04.2006	4:11	35:39.186'	07:19.805'	1396	4:43	35:39.191'	07:19.808'	1396	5:10	35:39.188'	07:19.806'	1396
210	BG	10	Captn Arutyunov MV	30.04.2006	5:29	35:39.400'	07:19.740'	1359	6:57	35:39.400'	07:19.740'	1358	6:24	35:39.397'	07:19.743'	1357
211	CTD/Ro	19	Captn Arutyunov MV	30.04.2006	7:03	35:39.698'	07:20.082'	1324	7:45	35:39.697'	07:20.081'	1325	8:20	35:39.695'	07:20.081'	1324
212	BIGO Recovery	1	Captn Arutyunov MV	30.04.2006	8:23	35:39.681'	07:19.981'	1317					9:21	35:39.730'	07:19.900'	1322
213	CTD/Ro	20	Captn Arutyunov MV	30.04.2006	9:52	35:39.696'	07:20.082'	1325	10:35	35:39.696'	07:20.082'	1325	11:10	35:39.697'	07:20.083'	1324
214	CTD/Ro	21	Captn Arutyunov MV	30.04.2006	12:35	35:43.192'	07:25.200'	1313	13:15	35:43.191'	07:25.202'	1314	13:40	35:43.192'	07:25.202'	1314
215	GRC	15	pelagic control	30.04.2006	13:50	35:43.190'	07:25.200'	1314	14:14	35:43.192'	07:25.200'	1314	14:38	35:43.190'	07:25.200'	1315
216	GRC	16	pelagic control	30.04.2006	15:18	35:43.192'	07:25.201'	1315	15:43	35:43.191'	07:25.200'	1315	16:21			
217#1	GKG	9	Captn Arutyunov MV	30.04.2006	17:41	35:39.646'	07:20.047'	1321	18:08	35:39.645'	07:20.048'	1321	19:06			
217#2	GKG	10	Captn Arutyunov MV	30.04.2006	19:10	35:39.643'	07:20.046'	1321	19:56	35:39.642'	07:20.049'	1321	20:30	35:39.640'	07:20.050'	1321
218	GKG	11	Captn Arutyunov MV	30.04.2006	20:45	35:39.699'	07:20.012'	1318	22:05	35:39.700'	07:20.012'	1318	22:40	35:39.700'	07:20.010'	1320
219	MB/PS	7	Captn Arutyunov MV	30.04.2006	23:25	35:40.100'	07:26.420'	1400					6:58	35:37.894'	07:27.434'	1337
220	BWS	2	Captn Arutyunov MV	01.05.2006	7:55	35:39.699'	07:20.011'	1320	8:33	35:39.700'	07:20.010'	1320	10:02	35:39.700'	7:20.010'	1319
221	CTD/Ro	22	Captn Arutyunov MV	01.05.2006	10:25	35:39.699'	07:20.011'	1319	11:00	35:39.699'	07:20.010'	1318	11:45	35:39.700'	07:20.010'	1318
222	MUC	10	Captn Arutyunov MV	01.05.2006	11:49	35:39.700'	07:20.010'	1318	12:16	35:39.700'	07:20.011'	1318	12:40	35:39.700'	07:20.010'	1319
223	BIGO Lander	2	Captn Arutyunov MV	01.05.2006	16:30	35:39.701'	07:20.011'	1320	17:27	35:39.700'	07:20.010'	1320	18:00	35:39.707'	07:20.020'	1322
224	CTD/Ro	23	Captn Arutyunov MV	01.05.2006	18:13	35:39.708'	07:20.022'	1322	18:57	35:39.708'	07:20.022'	1321	19:30	35:39.708'	07:20.022'	1320
225	BIGO Recovery	2	Captn Arutyunov MV	04.05.2006	8:02	35:39.682'	07:19.882'						8:45			
226#1	OFOS	7	Captn Arutyunov MV	04.05.2006	22:47	35:45.509'	07:24.693'	1191								
226#2	OFOS	8	Captn Arutyunov MV	05.05.2006	3:37	35:39.47'	07:16.82'	1336	4:05	35:39.473'	07:16.814'	1343	5:33	35:39.032'	07:16.636'	1328
227	GRC	17	Captn Arutyunov MV	05.05.2006	6:00	35:39.700'	07:20.010'	1319	6:34	35:39.699'	07:20.001'	1320	6:58			

Station	Gear	No.	Location	Date	Start	Coordinates		Depth	at bottom	Coordinates		Depth	end stat.	Coordinates		Depth
No.				2006	UTC	Lat. :N	Long. :W	(m)	UTC	Lat. :N	Long. :E	(m)	UTC	Lat. :N	Long. :E	(m)
228	CTD/Ro	24	Captn Arutyunov MV	05.05.2006	7:10	35:39.700'	07:20.011'	1320	7:53	35:39.701'	07:20.010'	1320	8:25	35:39.699'	07:20.011'	1320
229	GRC	18	Captn Arutyunov MV	05.05.2006	9:20	35:39.700'	07:20.010'	1320	9:42	35:39.700'	07:20.010'	1320	10:11			
230	FLUFO	4	Captn Arutyunov MV	05.05.2006	11:19	35:39.697'	07:20.008'	1318	12:05	35:39.697'	07:20.007'	1325	12:30	35:39.674'	07:20.000'	1317
231	CTD/Ro	25	Captn Arutyunov MV	05.05.2006	12:48	35:39.674'	07:19.999'	1317	13:30	35:39.674'	07:19.999'	1316	16:00	35:39.674'	07:19.999'	1317
232#1	BWS	3	Captn Arutyunov MV	05.05.2006	14:23	35:39.701'	07:20.009'	1318	15:06	35:39.703'	07:20.012'	1319	15:39			
232#2	BWS	4	Captn Arutyunov MV	05.05.2006	15:48	35:39.704'	07:20.012'	1321	16:26	35:39.702'	07:20.012'	1321	17:15			
233	PWPL	1	Captn Arutyunov MV	05.05.2006	18:25	35:39.692'	07:20.007'	1320	19:12	35:39.693'	07:20.008'	1319				
234	OFOS	9	Mercator MV	05.05.2006	23:40	35:17.882'	06:38.009'	407					6:14	35:17.686'	06:38.697'	381
235	CTD/Ro	26	Mercator MV	06.05.2006	6:52	35:18.168'	06:38.741'	388	7:12	35:18'	06:38'	388	7:29	35:18.168'	06:38.741'	387
236	CTD/Ro	27	Mercator MV	06.05.2006	7:55	35:17.911'	06:38.705'	353	8:13	35:17.912'	06:38.704'	351	8:35	35:17.911'	06:38.703'	352
237#1	MUC	11	Mercator MV	06.05.2006	9:01	35:17.912'	06:38.704'	353	10:02	35:17.908'	06:38.687	353				
237#2	MUC	12	Mercator MV	06.05.2006	10:30	35:17.911'	06:38.701'	352	11:26	35:17.914'	06:38.687'	353	11:40			
238	GRC	19	Mercator MV	06.05.2006	11:42	35:17.916'	06:38.700'	353	12:40	35:17.916'	06:38.700'	353	12:53			
239#1	GRC	20	Mercator MV	06.05.2006	13:19	35:17.916'	06:38.700'	353	13:31	35:17.917'	06:38.700'	352	14:00			
239#2	GRC	21	Mercator MV	06.05.2006	14:03	35:17.917'	06:38.700'	353					14:25	35:17.916'	06:38.699'	353
240	GRC	22	pelagic control	06.05.2006	14:57	35:17.355'	06:37.117'	401	15:21	35:17.355'	06:37.116'	401	18:55			
241	GKG	12	Mercator MV	06.05.2006	16:20	35:17.918'	06:38.717'	353	16:26	35:17.918'	06:38.717'	353	16:37			
242	GKG	13	Mercator MV	06.05.2006	16:55	35:17.871'	06:38.813'	350	17:03	35:17.87'	06:38.81'	350				
243	CTD/Ro	28	deep water	06.05.2006	19:30	35:18.991'	07:11.005'	1184	20:10	35:18.989'	07:11.005'	1184	20:45	35:18.989'	07:11.005'	1184
244	MB/PS	8	Captn Arutyunov MV	06.05.2006	23:27	35:39.7'	07:19.0'	1300					6:57			
245	OFOS	10	Renard Ridge	07.05.2006	2:38	35:17.328'	06:46.800'	570	2:53	35:17.328'	06:46.800'	570	4:46	35:17.652'	06:47.222'	508
246	BIGO	3	Captn Arutyunov MV	07.05.2006	9:30	35:39.701'	07:20.012'	1320	10:23	35:39.706'	07:20.001'	1321	12:56			
247	BWS	5	Captn Arutyunov MV	07.05.2006	11:35	35:39.698'	07:20.012'	1319					13:00	35:39.703'	07:20.009'	1323
248	DOS Recovery	3	Captn Arutyunov MV	07.05.2006	13:57	35:39.660'	07:19.972'	1320					14:34			
249	FLUFO Recovery	4	Captn Arutyunov MV	07.05.2006	14:52	35:39.700'	07:19:984'	1320					15:32			
250	PWPL	1	Captn Arutyunov MV	07.05.2006	16:09	35:39:640'	07:19:980'	1320					16:45			
251	OFOS	11	Renard Ridge	07.05.2006	20:30	35:21.118'	06:50.582	625	20:47	35:21.120'	06:50.576'	625	4:52	35:21.854'N	06:52.529'W	626
252	GRC	23	Renard Ridge	08.05.2006	6:13	35:17.688'	06:47.256'	509	6:29	35:17.688'	06:47.256'	506	6:50			
253	GRC	24	Renard Ridge	08.05.2006	7:15	35:17.997'	06:47.798'	551	7:33	35:17.998'	06:47.797'	551	8:02			
254	GRC	25	Renard Ridge	08.05.2006	8:32	35:18.881'	06:48.075'	549	8:52	35:18.881'	06:48.077'	545	9:08			
255	TV-Grab	3	Renard Ridge	08.05.2006	10:15	35:17.331'	06:46.803'	569								
256	GRC	26	Renard Ridge	08.05.2006	13:37	35:21.128'	06:50.003'	552	14:22	35:21.127'	06:50.001'	551	14:43			
257	GRC	27	Renard Ridge	08.05.2006	15:14	35:21.211'	06:50.954'	582	15:31	35:21.111'	06:50.957'	585	15:46			
258#1	GKG	14	Renard Ridge	08.05.2006	16:12	35:21.160'	06:50.891'	612	16:27	35:21.167'	06:50.890'	591				
258#2	GKG	15	Renard Ridge	08.05.2006	17:23	35:21.167'	06:50.891'	583	17:33	35:21.166'	06:50.891'	600	17:51	35:21.165'	06:50.890'	596

Station	Gear	No.	Location	Date	Start	Coordinates		Depth	at bottom	Coordinates		Depth	end stat.	Coordinates		Depth
No.				2006	UTC	Lat. :N	Long. :W	(m)	UTC	Lat. :N	Long. :E	(m)	UTC	Lat. :N	Long. :E	(m)
259	GKG	16	Renard Ridge	08.05.2006	18:11	35:21.335'	06:51.302'	634	18:24	35:21.334'	06:51.303'	635	18:43	35:21.335'	06:51.303'	635
260	GKG	17	Renard Ridge	08.05.2006	19:09	35:21.983'	06:51.897'	573	19:21	35:21.985'	06:51.898'	574	19:40	35:21.982'	06:51.897'	588
261	MB/PS	9	Meknes MV	08.05.2006	23:15	35:2.284'	07:2.273'	890					4:25			
262	MB/PS Flare Imag.	1	Meknes MV	09.05.2006	4:35	35:2.384'	07:2.273'	890					6:42			
263	GRC	28	Mercator MV	09.05.2006	8:51	35:17.866'	06:38.797'	351	9:04	35:17.866'	06:38.797'	351	9:17			
264	CTD/Ro	29	Mercator MV	09.05.2006	9:30	35:17.853'	06:38.769'	350	9:45	35:17.853'	06:38.770'	350	10:00	35:17.853'	06:38.770'	350
265	GRC	29	Mercator MV	09.05.2006	10:29	35:17.880'	06:38.501'	375	10:40	35:17.881'	06:38.499'	375	10:50	35:17.881'	06:38.500'	375
266#1	CTD/Ro	30	Paleo-oceanogr. site	09.05.2006	11:50	35:20.501'	06:44.601'	569	12:11	35:20.502'	06:44.600'	569	12:30	35:20.502'	06:44.600'	570
266#2	GKG	18	Paleo-oceanogr. Site	09.05.2006	12:34	35:20.500'	06:44.595'	569		35:20.500'	06:44.595'	569	13:18			
266#3	GRC	30	Paleo-oceanogr. Site	09.05.2006	13:34	35:20.502'	06:44.590'	569	13:46	35:20.500'	06:44.592'	569	14:03			
267	MUC	13	Mercator MV	09.05.2006	15:14	35:17.872'	06:38.789'	350	15:25	35:17.875'	06:38.789'	350	15:37			
268	CTD/Ro	31	Renard Ridge	09.05.2006	16:46	35:21.340'	06:51.029'	612	17:12	35:21.338'	06:51.029'	606	17:30	35:21.337'	06:51.029'	612
269	OFOS	12	Meknes MV	09.05.2006	19:50	34:59.370'	07:04.346'	745	20:36	34:59.365'	07:04.347'	745	22:32			
270	OFOS	13	Meknes MV	09.05.2006	22:58	34:59.649'	07:04.566'	749	23:21	34:58.643'	07:04.552'	750,1	1:00	34:00.244'	07:04.412	752
271#1	BWS	6	Captn Arutyunov MV	10.05.2006	6:15	35:39.698'	07:20.006'	1316								
271#2	BWS	7	Captn Arutyunov MV	10.05.2006	7:40	35:39.700'	07:20.016'	1320	8:19	35:39.700'	07:20.015'	1320	9:03			
272	BWS	8	Captn Arutyunov MV	10.05.2006	9:25	35:39.704'	07:20.016'	1320	10:00	35:39.702'	07:20.017'	1318	10:59			
273	PWPL	2	Captn Arutyunov MV	10.05.2006	12:20	35:39.705'	07:20.018'	1320	13:15	35:39.705'	07:20.019'	1320	13:54			
274	BIGO Recovery	3	Captn Arutyunov MV	10.05.2006	14:29	35:39.738'	07:20.010'	1321					15:14			
275	GASQUANT	1	Mercator MV	10.05.2006	18:57	35:17.825'	06:38.788'	350	19:32	35:17.886'	06:38.729'	342	19:54			
276	CTD/Ro	32	Mercator MV	10.05.2006	20:21	35:18.020'	06:38.890'	375	20:44	35:18.020'	06:38.890'	378	21:05	35:18.018'	06:38.890'	377
277	CTD/Ro	33	Mercator MV	10.05.2006	21:42	35:17.673'	06:38.916'	389	22:00	35:17.672'	06:38.913'	389	22:25	35:17.674'	06:38.913'	390
278	CTD/Ro	34	Mercator MV	10.05.2006	22:49	35:17.707'	06:38.579'	385	23:05	35:17.700'	06:38.578'	385	23:30	35:17.705'	06:38.582'	385
279	CTD/Ro	35	Mercator MV	11.05.2006	0:02	35:18.074'	06:38.569'	385	0:15	35:18.074'	06:38.569'	385	0:40	35:18.073'	06:38.568'	384
280	CTD/Ro	36	Mercator MV	11.05.2006	1:10	35:17.930'	06:38.789'	353	1:25	35:17.927'	06:38.789'	354	1:50	35:17.926'	06:38.791'	354
281	OFOS	14	Mercator MV	11.05.2006	2:48	35:19.394'	06:39.118'	447	3:03	35:19.388'	06:39.113'	447.1	6:45	35:20.152'	06:39.848'	447
282	GRC	31	Mercator MV	11.05.2006	7:51	35:17.882'	06:39.044'	378	8:03	35:17.880'	06:39.044'	378	8:25			
283	GRC	32	Mercator MV	11.05.2006	8:59	35:18.393'	06:39.869'	491	9:12	35:18.393'	06:39.869'	491	?			
284	GRC	33	pelagic control	11.05.2006	10:51	35:20.501	06:44.600'	568	11:11	35:20.501	06:44.600'	568	?			
285	GRC	34	Mercator MV	11.05.2006	13:02	35:17.915'	06:38.705'	359	13:18	35:17.951'	06:38.704'	359	13:57			
286	GASQUANT Recov.	1	Mercator MV	11.05.2006	14:31	35:17.958'	06:38.734'	350					14:50			
287	MUC	14	Mercator MV	11.05.2006	15:40	35:17.880'	06:39.044'	380	15:58	35:17.890'	06:39.059'	379	16:12			
288	CTD/Ro	37	W Mercator MV	11.05.2006	17:22	35:25.702'	06:52.250'	737	17:50	35:25.731'	06:52.270'	733	18:10	35:25.732' N	06:52.270' W	734

Station	Gear	No.	Location	Date	Start	Coordinates		Depth	at bottom	Coordinates		Depth	end stat.	Coordinates		Depth
No.				2006	UTC	Lat. :N	Long. :W	(m)	UTC	Lat. :N	Long. :E	(m)	UTC	Lat. :N	Long. :E	(m)
289	OFOS	15	Vernardsky Ridge	11.05.2006	19:12	35:22.976'	06:42.273'	448.9	19:30	35:22.976'	06:42.272'	448.5	22:24	35:23.706'	06:41.981'	507
290	OFOS	16	Vernardsky Ridge	11.05.2006	22:56	35:25.253'	06:44.003'	480.2	23:11	35:25.255'	06:44.004'	480.4	0:27	35:25.696'	06:43.831'	563
291	OFOS	17	Vernardsky Ridge	12.05.2006	1:14	35:26.875'	06:45.642'	631	1:33	35:26.875'	06:45.642'	626	4:49	35:26.023'	06:46.092'	530
292	GRC	35	Renard Ridge	12.05.2006	6:15	35:21.177'	06:50.896'	591	6:27	35:21.176'	06:50.896'	591	7:00			
293	GRC	36	Renard Ridge	12.05.2006	7:26	35:21.993'	06:51.903'	578	7:43	35:21.993'	06:51.903'	590	8:11			
294	GRC	37	Renard Ridge	12.05.2006	9:01	35:17.459'	06:47.012'	534	9:16	35:17.458'	06:47.012'	532	9:32			
295	CTD/Ro	38	Captn Arutyunov MV	12.05.2006	12:15	35:39.698'	07:20.020'	1320	13:03	35:39.697'	07:20.019'	1320	13:30	35:39.696'	07:20.019'	1320
296	MUC	15	Captn Arutyunov MV	12.05.2006	13:39	35:39.696'	07:20.018'	1319	14:18	35:39.696'	07:20.013'	1322	?			
297	FLUFO	5	Captn Arutyunov MV	12.05.2006	16:53	35:39.698'	07:20.006'	1318					20:39			
298	CTD/Ro	39	Captn Arutyunov MV	12.05.2006	21:01	35:39.603'	07:19.989'	1321	22:00	35:39.596'	07:19.984'	1321	23:28	35:39.751'	07:19.958'	1321
299	CTD/Ro	40	Captn Arutyunov MV	13.05.2006	0:01	35:39.607'	07:20.049'	1324	0:41	35:39.600'	07:20.046'	1324	2:10	35:39.757'	07:20.045'	1326
300	CTD/Ro	41	Captn Arutyunov MV	13.05.2006	2:40	35:39.607'	07:20.118'	1329	3:30	35:39.620'	07:20.116'	1325	5:00	35:39.801'	07:20.105'	1329
301	FLUFO	6	Captn Arutyunov MV	13.05.2006	6:10	35:39.702'	07:20.015'	1320					6:36			
302	PWPL Recovery	2	Captn Arutyunov MV	13.05.2006	6:41	35:39.703'	07:20.017'	1320					7:25			
303	FLUFO	7	Captn Arutyunov MV	13.05.2006	9:30	35:39.706'	07:20.011'	1319	10:20	35:39.705'	07:20.013'	1318	11:22			
304	BIGO	4	Captn Arutyunov MV	13.05.2006	11:41	35:39.700'	07:20.011'	1318	12:40	35:39.700'	07:20.010'	1319	13:31			
305#1	GRC	38	Meknes	13.05.2006	17:36	34:59.134'	07:04.412'	694	17:50	34:59.135'	07:04.413'	694	18:12			
305#2	GRC	39	Meknes	13.05.2006	18:35	34:59.139'	07:04.405'	694	18:52	34:59.136'	07:04.404'	649				
306	GRC	40	Meknes	13.05.2006	19:14	34:59.137'	07:04.404'	694	19:34	34:59.138'	07:04.404'	694				
307	GKG	19	Pen Duick	13.05.2006	22:22	35:17.557'	06:47.114'	533	22:32	35:17.556'	06:47.113'	533	22:55	35:17.611'	06:47.176'	533
308	GKG	20	Pen Duick	13.05.2006	23:01	35:17.646'	06:47.215'	520	23:12	35:17.646'	06:47.212'	522	23:30	35:17.646'	06:47.214'	514
309	BG	11	Vernardsky Ridge	14.05.2006	0:49	35:26.388'	06:45.799'	554	1:11	35:26.388'	06:45.797'	555	1:25			
310	BG	12	Vernardsky Ridge	14.05.2006	1:27	35:26.387'	06:45.798'	555	1:48	35:26.387'	06:45.798'	555	2:00	35:26.387'	06:45.798'	555
311	BG	13	Vernardsky Ridge	14.05.2006	2:05	35:26.387'	06:45.797'	556	2:16	35:26.387'	06:45.797'	559	2:28			
312	BG	14	Vernardsky Ridge	14.05.2006	2:30	35:26.387'	06:45.797'	555	2:42	35:26.387'	06:45.798'	555	2:55			
313	BG	15	Vernardsky Ridge	14.05.2006	3:02	35:26.385'	06:45.797'	555	3:13	35:26.385'	06:45.798'	554	3:28			
314	BG	16	Vernardsky Ridge	14.05.2006	3:52	35:26.114'	06:45.883'	537	4:03	35:26.113'	06:45.883'	537	4:16			
315	BG	17	Vernardsky Ridge	14.05.2006	4:18	35:26.115'	06:45.882'	541	4:28	35:26.114'	06:45.882'	537	4:40			
316	BG	18	Vernardsky Ridge	14.05.2006	4:54	35:26.204'	06:45.856'	550	5:04	35:26.205'	06:45.858'	550	5:15			
317	BG	19	Vernardsky Ridge	14.05.2006	5:28	35:26.209'	06:45.853'	550	5:38	35:26.209'	06:45.852'	552	5:55			
318	BG	20	Vernardsky Ridge	14.05.2006	6:03	35:26.212'	06:45.848'	550	6:14	35:26.211'	06:45.849'	551	6:28			
319	GKG	21	Meknes	14.05.2006	9:12	34:59.100'	07:04.435'	695	9:26	34:59.100'	07:04.439'	695				
320	OFOS	18	Meknes	14.05.2006	10:30	34:59.101'	07:04.438'	698	10:46	34:59.100'	07:04.439'	698	11:57	34:58.793'	07:04.393'	731
321	GKG	22	Meknes	14.05.2006	12:33	34:58.796'	07:04.393'	731	12:46	34:58.796'	07:04.394'	732	13:00			
322	GRC	41	Meknes	14.05.2006	13:34	34:58.902'	07:04.421'	707	13:49	34:58.902'	07:04.423'	708	14:04			

Station	Gear	No.	Location	Date	Start	Coordinates		Depth	at bottom	Coordinates		Depth	end stat.	Coordinates		Depth
No.				2006	UTC	Lat. :N	Long. :W	(m)	UTC	Lat. :N	Long. :E	(m)	UTC	Lat. :N	Long. :E	(m)
323	GRC	42	Meknes	14.05.2006	14:30	34:58.903'	07:04.422'	707	14:49	34:58.904'	07:04.424'	710	15:08			
324	GRC	43	Meknes	14.05.2006	15:25	34:59.033'	07:04.562'	708	15:41	34:59.033'	07:04.562'	709				
325	GRC	44	Meknes	14.05.2006	16:21	34:59.490'	07:04.558'	758	16:36	34:59.490'	07:04.558'	758				
326	CTD/Ro	42	Meknes	14.05.2006	17:28	34:58.801'	07:04.404'	730	18:05	34:58.801'	07:04.400'	731	20:45	34:59.008'	07:04.432'	696
327	CTD/Ro	43	EW Transect	14.05.2006	22:20	34:57.500'	06:46.000'	416	22:35	34:57.501'	06:46.000'	416	22:45	34:57.501'	06:46.000'	416
328	CTD/Ro	44	EW Transect	14.05.2006	23:53	34:57.493'	06:59.993'	739	0:17	34:57.493'	06:59.993'	739	0:32	34:57.493'	06:59.993'	739
329	CTD/Ro	45	EW Transect	15.05.2006	2:00	34:57.445'	07:16.041'	1033	2:34	34:57.443'	07:16.042'	1034	2:55	34:57.443'	07:16	1034
330	CTD/Ro	46	EW Transect	15.05.2006	4:12	34:57.500'	07:34.001'	1380	4:59	34:57.501'	07:34.001'	1379	5:26	34:57.501'	07:34.000'	1379
331	GRC (12m)	45	Paleo-oceanogr. Site	15.05.2006	9:07	35:30.001'	07:04.231'	1076	9:32	35:30.000'	07:04.232'	1076				
332	BIGO Recovery	4	Captn Arutyunov	15.05.2006	11:42	35:39.692'	07:20.033'	1320					12:27			
333	OFOS	19	Renard Ridge	15.05.2006	15:10	35:22.424'	06:51.954'	621					16:48	35:21.837'	06:51.877'	610
334	OFOS	20	Renard Ridge	15.05.2006	17:04	35:21.963'	06:51.837'	600	17:19	35:21.963'	06:51.839'	600	17:48	35:21.973'	06:51.975'	604
335	GKG	23	Meknes	15.05.2006	19:55	34:59.035'	07:04.552'	703	20:09	34:59.035'	07:04.552'	703	20:25	34:59.035'	07:04.552'	703
336	GKG	24	Meknes	15.05.2006	20:39	34:59.140'	07:04.402'	694	20:53	34:59.140'	07:04.403'	694	21:16			694
337	CTD/Ro	47	Renard Ridge	15.05.2006	23:27	35:20.993'	06:57.875'	655	23:56	35:20.993'	06:51.875'	655	0:10	35:20.994'	06:51.875'	655
338	CTD/Ro	48	Renard Ridge	16.05.2006	0:30	35:21.516'	06:51.873'	626	0:50	35:21.516'	06:51.874'	626	1:06	35:21.516'	06:51.875'	626
339	CTD/Ro	49	Renard Ridge	16.05.2006	1:20	35:21.963'	06:51.875'	580	1:49	35:21.963'	06:51.875'	580	2:02	35:21.963'	06:51.875'	580
340	CTD/Ro	50	Renard Ridge	16.05.2006	2:21	35:22.461'	06:51.872'	620	2:44	35:22.460'	06:51.871'	620	3:00	35:22.461'	06:51.872'	620
341	CTD/Ro	51	Renard Ridge	16.05.2006	3:15	35:22.873'	06:51.874'	700	3:39	35:22.873'	06:51.874'	700	3:55	35:22.873'	06:57.875'	699
342	CTD/Ro	52	Renard Ridge	16.05.2006	4:10	35:23.144'	06:52.867'	744	4:32	35:23.144'	06:51.867'	744	4:50	35:23.144'	06:51.867'	744
343	GRC (12m)	46	Meknes	16.05.2006	7:00	34:58.500'	07:07.002'	811	7:31	34:58.501'	07:07.002'	810	7:56			
344	FLUFO Recovery	5	Captn Arutyunov	16.05.2006	11:28	35:39.697'	07:20.038'	1320					12:30			
345	OFOS	21	Captn Arutyunov	16.05.2006	12:56	35:39.696'	07:20.009'	1317	14:08	35:39.696'	07:20.010'	1320	15:46	35:39.725'	07:20.039'	
346	CTD/Ro	53	Captn Arutyunov	16.05.2006	15:55	35:39.655'	07:20.023'	1319	16:43	35:39.656'	07:20.021'	1319	18:40	35:39.705'	07:20.019'	1319
347	PWPL	3	Captn Arutyunov	16.05.2006	19:15	35:39.705'	07:20.019'	1318	20:11	35:39.697'	07:20.019'	1317	20:57	35:39.704'	07:19.935	1319
348	OFOS	22	Renard Ridge	16.05.2006	23:36	35:21.875'	06:52.436'	628	23:56	35:21.860'	06:52.435'		1:31	35:21.326'	06:52.274'	
349	OFOS	23	Renard Ridge	17.05.2006	2:11	35:20.935'	06:49.761'	524	2:20	35:20.926'	06:49.761'	525	3:47	35:20.939'	06:49.212'	521
350	CTD/Ro	54	Renard Ridge	17.05.2006	4:24	35:22.006'	06:53.420'	681	4:50	35:22.003'	06:53.417'	681	5:00	35:22.'	06:00	689
351	CTD/Ro	55	Renard Ridge	17.05.2006	5:35	35:22.014'	06:52.574'	607	6:10	35:22.014'	06:52.574'	597	6:23	35:22.014'	06:52.574'	606
352	CTD/Ro	56	Renard Ridge	17.05.2006	6:52	35:22.022'	06:51.173'	640	7:16	35:22.021'	06:51.173'	640	7:30	35:22.021'	06:51.173'	
353	CTD/Ro	57	Renard Ridge	17.05.2006	7:55	35:22.028'	06:50.289'	702	8:17	35:22.028'	06:50.288'	702	8:35	35:22.028'	06:50.288'	702
354#1	APN	1	Renard Ridge	17.05.2006	9:27	35:21.994'	06:51.976'	598					9:35			
354#2	APN	2	Renard Ridge	17.05.2006	9:37	35:21.993'	06:51.977'	598					10:03			
354#3	APN	3	Renard Ridge	17.05.2006	10:04	35:21.993'	06:51.977'	594					10:32			

Station	Gear	No.	Location	Date	Start	Coordinates		Depth	at bottom	Coordinates		Depth	end stat.	Coordinates		Depth
No.				2006	UTC	Lat. :N	Long. :W	(m)	UTC	Lat. :N	Long. :E	(m)	UTC	Lat. :N	Long. :E	(m)
355	DOS Lander	4	Renard Ridge	17.05.2006	11:10	35:21.998'	06:51.982'	593	12:10	35:21.985'	06:51.899'	575	12:36	35:21.986'	06:51.905'	574
356#1	TV-Grab	4	Renard Ridge	17.05.2006	13:47	35:20.930'	06:49.600'	522	14:01	35:20.992'	06:49.595'	520				
356#2	TV-Grab	5	Renard Ridge	17.05.2006	14:30	35:20.931´	06:49.595	519	14:58	35:20.930´	06:49.594´	520	15:31	35:20.929´	06:49.554	533
357	MB/PS	10	Renard Ridge	17.05.2006	16:04	35:21.086´	06:46.285´	295					21:21	35:17.05´	06:44.48	
358	MB/PS	11	Renard Ridge	17.05.2006	21:47	35:17.98´	06:40.60´	479					23:25	35:17.7´	06:37.5´	403